Oil Sands 102: How Does Oil Come from Sand?

Description

Canada has massive oil resources. That's why it's important for investors to have a basic understanding of these resources. Last time I explored a basic overview of the resources base and its importance to global oil producers. This time, we'll take a closer look at how producers actually produce oil from sand.

Oil Sands Geography

Canada's oil sands are located in three deposits – Athabasca, Peace River and Cold Lake – and are mainly in Alberta. In Athabasca some of the bitumen is located closer to the surface and can be mined in open pits. The rest of the deposits, especially those in Peace River and Cold Lake, are too deep and must be extracted in situ or in place. Let's take a closer look at both of these processes.

Mining

About 20% of oil contained in the region can be mined. **Shell** (NYSE: RDS-A) is one of the many companies mining oil, which is found in deposits that are within 250 feet of the surface. Companies use mechanical shovels to dig up the sand and it's hauled by large trucks to treatment areas. Only about 3% of land containing the oil sands is close enough to the surface where it can be mined.

oil sand mining
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Photo credit: Flickr/Shell

Mining the sands has its advantages and disadvantages. One advantage is that producers are able to extract about 90% of the original oil in place, which is a tremendous amount more than conventional oil production, which typically can only recover about 35% of the original oil. The downside is that this creates large open pit mining operations as well as what are called tailing ponds, which eventually need to be reclaimed. This is a decade's long process for the industry and something that environmentalists frown upon.

For oil sands producers, the advantages of mining are well worth it. Homegrown Canadian producer **Suncor Energy**

(TSX: SU) (NYSE: SU), for example sees the potential for 6.7 billion barrels of oil equivalent resources that can be mined from its current asset base. That's nearly as much oil as the entire company's current proved and probable reserves. It's currently considering two projects including the Fort Hills Mine which is part owned by diversified Canadian miner **Teck Resources** (TSX: TCK.B). The mine, if brought online, would have the capacity to produce 164,000 barrels per day. Furthermore, even though Teck only owns 20% of the project, the cash flow produced from just the first phase would equate to 10% of the company's 2018 cash flow. These oil rich cash flows are what has producers flocking to the oil sands.

In Situ

For the oil trapped farther underneath the ground, producers access that oil in situ or in place. A producer typically drills two wells, one which it will use to inject steam and the other to recover the oil. These techniques are able to recover between 20%-75% of the original oil in place.

One of the more common in situ processes is called Steam Assisted Gravity Drainage or SAGD. **Devon Energy** (NYSE: DVN) is one of the many companies using this innovative process through its Jackfish project. The company has a video detailing its process which can be accessed by clicking here . It has developed a very repeatable process, which has a much lower environmental footprint than a mining operation. Because of this, Devon has very visible oil sands production growth of 17%-20% annually through 2020.

Devon in situ

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Jackfish oil sands project. Photo credit: Devon Energy

Another spin on SAGD is called SAP, or solvent aided process. What companies do is combine the stream that's injected in the SAGD process with a solvent like butane to bring more oil to the surface. **Cenovus Energy** (TSX: CVE) (NYSE: CVE), for example, is using it to improve the economics at its Narrow Lake project. It sees it increasing full field recovery rates by 15%, while decreasing sustaining capital and non-fuel operating costs. It also lowers emissions and water usage, however, it does cost more upfront.

Final Foolish Thoughts

The oil sands of Canada show the great lengths oil companies will go to in order to supply the world with more oil. That's why it's important for investors to have a better idea how oil companies actually get the oil out. In the next part of this series we'll take a closer look at some of the key producers in the oil sands and then dig a little deeper into what the future holds for Canada's world class oil play.

How Canada is Powering China

What you might not know is that Canada has a lot more than just oil. One of the most important resources this country has, and one your portfolio could be best served by, is uranium – the key ingredient for nuclear power. This is especially true with the global nuclear market ramping up in places like China.

This is why The Motley Fool has prepared a Special **FREE** Report that will clue you into the two best uranium companies in Canada. It's called "Fuel Your Portfolio With This Energetic Commodity," and you can receive a copy at no charge by **clicking here!**

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Date
2025/08/15
Date Created
2013/09/20
Author

mdilallo